

RUNTIME MONITORING USING A DATATAKER DATA LOGGER

FOR MACHINE MONITORING, PRODUCTIVITY ASSESSMENT & TROUBLESHOOTING

At [CAS DataLoggers](#), many of our callers want to see how often one or more of their machines are operating and when. This pinpoints machine downtime and can identify poor work productivity, or identifies if another cause is at work (power outages etc.) In our latest Technical Article, we outline how to configure a Series 4 dataTaker DT8x Data Logger for runtime monitoring. What is downtime? Downtime can be defined as periods of inoperability, when a machine or device is not operating. This can be different from simply powered on and can be triggered by electrical switch, rotation or some other measured parameter on the machine.

There can be many different causes of machine downtime.
These causes of downtime include:

Workstation starve – when there is no material or part available on which to operate

Workstation block – when the output of the machine is blocked by the last finished part

Failure or fault – when the machine has an active fault or failure

Power outage – when there is no operating electric power, or pneumatic air or hydraulic pressure

Personnel issue – no operator available

If suitable sensors are available to determine which causes exists, this can also be logged.

CONFIGURING THE DATATAKER

While most basic data loggers typically don't get into this level of functionality, there are many models of intelligent devices which can monitor runtime and more complex applications. For runtime monitoring, these data loggers and data acquisition systems feature one or more digital channels.

To configure the dataTaker, users define CVs (Channel Variables) in the dataTaker's built-in dEX software. A channel variable is a memory location (or register) in the dataTaker's operating memory used for holding or manipulating data or state. Defining CVs enables users to automate data collection and control features.

Using a [dataTaker DT80 intelligent data logger](#), the logger's configuration reads machine run data using the logger's two digital inputs. Our program shows how to setup a few simple calculations of machine runtime and On/Off events. Our data logging schedule runs every second, taking a sample from the DT80's Digital Sensor Channels 1 and 2.



DEFINING THE SCHEDULE

Schedule 1 shows example data and code to add this functionality. It consists of:

Counter1_1State: Code = 1MODBUS("Machine1Power",AD11,R4:9,=1CV)
(This line returns a 1 or 0 value for Channel 1 to indicate if the machine is currently running, i.e. its On or Off status).

Counter 1_2State: Code = 1MODBUS("Machine1Move",AD11,R4:10,=11CV)
(This line returns a 1 or 0 value for Channel 2 showing if the machine is currently on or off).

Counter1_1OnTime: Code = IF(1CV>0.5){2CV=2CV+1}
(This line gives the duration of time that the machine has been on, measured from the last recorded sample)

Counter1_2OnTime: Code = IF(11CV>0.5){12CV=12CV+1}

TOTALIZING RUN TIME

Our dataTaker has also been programmed to calculate and display Total Machine Run Time. Every night at midnight, the data logger generates runtime cycle totals and runtime totals for that day. This data is given as 'PreviousDay1_1On' and also as 'PreviousDay1_1Off', and for runtime it is 'PreviousDay1_2On' and 'PreviousDay1_2Off'. This allows users to compare runtime across many different days to spot trends.

Meanwhile the calculations are named Machine OnTime, OffTime, MoveTime and NoMoveTime. All are expressed in seconds.

When it generates these daily totals, the dataTaker also resets all counters, having been programmed to do this so that it can count the new day's total from zero. The code to reset all these values is:

2CV(W)=0

3CV(W)=0

12CV(W)=0

13CV(W)=0

For further information on runtime monitoring using [dataTaker data acquisition systems](#), or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.